Options for Revisions to UCMR

March 24, 2010

- Schedule
- Workgroup
- UCMR 3 Candidate Analytes
- Costs
- Rule Applicability to PWSs
- Stakeholder Meeting

UCMR 3 Schedule

- Tier Rule (Tier 3) — Completed
- Draft Proposal for TSC Review — May 2010
- Proposal to OPEI for OMB Review — August 2010
- Publication of Proposal — Jan 2011
- Publication of Final Rule — Jan 2012
- Monitoring — Jan 2013 – Dec 2015

UCMR Workgroup

- **Held four meetings**
- **40 members**
  - **7 Regions**
  - **ORD**
  - **OPEI**
  - **OGC**
  - **OST**
  - **2 States**
- **Very involved and helpful**

Analyte Selection

- First priority CCL 3
  (24 of 30 CCL)
- Not in previous UCMR
- Prioritize by health
- Method available
- Take into account costs, efficiencies and laboratory capacity

Method 539

(LC/MS/MS)

Estriol
17β-Estradiol
17α-Ethynylestradiol
Equilin
Estrone
Testosterone*
4-Androstene-3,17-dione*

* = Non-CCL

Assessment - EPTDS
Analysis Costs

Large PWSs	$6.5 M
EPA	$0.7 M

Method 522 Analytes

(GC/MS)

1,4 – Dioxane

Assessment – EPTDS

Analysis Costs

Large PWSs	$3.9 M
EPA	$0.4 M

Method 200.8

(ICP/MS)

Vanadium

Molybdenum

Cobalt

Strontium

Assessment – EPTDS, MR

Analysis Costs

Large PWSs	$2.6 M
EPA	$0.3 M

Method 300.1

(IC/Conductivity)

Chlorate

Gaseous chlorine

Potassium hypochlorite

Sodium hypochlorite

Assessment - EPTDS	
Analysis Costs	
Large PWSs	$1.3 M
EPA	$0.1 M

Method 537 Analytes
(LC/MS/MS)

Perfluorooctanesulfonic acid	**PFOS**
Perfluorooctanoic acid	**PFOA**
Perfluorononanoic acid*	**PFNA**
Perfluorohexanesulfonic acid*	**PFHxS**
Perfluoroheptanoic acid*	**PFHpA**
Perfluorobutanesulfonic acid*	**PFBS**

* = Non-CCL

Screening - EPTDS
Analysis Costs

Large PWSs	$2.0 M
EPA	$0.8 M

Method 524.3 Analytes
(GC/MS)

1,1 - Dichloroethane
1,2,3 – Trichloropropane
1,3 – Butadiene
Chloromethane
Bromochloromethane
Bromomethane
Propylbenzene
Chlorodifluoromethane (Freon 22)
sec-Butylbenzene

Assessment – EPTDS
Analysis Costs

Large PWSs	$3.9 M
EPA	$0.4 M

Microbial Analytes

- **2 UCMR Analytes**
  - **Enteroviruses**
    - »**Cell Culture**
    - »**qPCR**
  - **Noroviruses**
    - »**qPCR**
- **5 Indicators** **(not counted against UCMR 30)**
  - **Total Coliform**
  - ***E.coli***
  - **Coliphage**
  - ***Enterococci***
  - **Aerobic spores**

Pre-Screen – EPTDS

Analysis Costs	
Large PWSs	$0
EPA	$2.1 M

Virus Monitoring Design

- Small systems serving < 1,000 customers
- Un-disinfected ground water
- CWS, NTCWS, NTNCWS, Transients
- Select 800 systems (design from UCMR 1 and 2)
- EPA to provide samplers
  - Connect manifold/filter to existing tap
  - Manifold has anti-backflow and flow gauge
  - Must use sterile techniques

Overall Analytical Costs*

	UCMR 2	UCMR 3
# of Analytes	25	30
# of Methods	5	8
EPA Analytical Costs (SRF)	$5.5 M	$6.1 M
Large PWS Analytical Costs	$25.8 M	$23.4 M
Total Analytical Costs	$31.3 M	$29.5 M

* *These estimates do not include labor costs, or other costs not directly related to sample analysis (e.g., State costs, or EPA's coordination and oversight costs).*

These costs include shipping costs not included in previously presented individual method costs.

Recommended Applicability Change

- **Currently, PWSs that purchase 100% are exempt**
- **Change under consideration would require PWSs that purchase 100% of their water to monitor**
- **Ends differentiation between systems that purchase some or most of their water and those that purchase 100%**
- **Provides more accurate population and exposure estimates**
- **Estimate increase of 400 – 600 systems (3,300 currently to 3,700 - 3,900)**

Stakeholder Meeting

- **April 7, 2010 – 9:00 am – 5:00 pm**
- **Crystal City Marriot**
- **FR announcement published**

Virus Monitoring Costs

- Sampling $800 K
- Enterovirus Analyses $950 K
- Norovirus qPCR $50 K
- Indicators $300 K

- Subtotal $2.1 M

Why consider enteroviruses for UCMR3?

- **Philosophical considerations**

  - Recent Borchardt data showed
    - Statistically significant correlation between viral qPCR and self-reported AGI (acute gastrointestinal illness)
      - First study to show statistically significant correlation between viral occurrence in undisinfected wells and health effects in a study population
    - low (2%) TC occurrence among study systems under TCR sampling
      - 34 out of 36 wells had viral occurrence

      *Systems in compliance with TCR, RTCR and/or GWR could still be at risk for viruses
    - viral occurrence of 9% for enterovirus and 4% for norovirus in CWS
    - *We expect higher occurrence by targeting systems serving less than 1000 customers, including transients

  - Viral occurrence and companion indicator data would support Reg Det
    - Current available viral and indicator occurrence data is very limited for undisinfected GWS

Why consider enteroviruses for UCMR3?
(cont'd)

❖ Practical considerations

- On CCL3
- Methods ready; suggest measuring by cel culture and qPCR
- Used in ICR survey
  - Nanoceram filter (10 fold cheaper than 1MDS filter) - paper published
  - Method used in Korea for environmental samples
- SRF funds available to do this monitoring
- Additional analysis by qPCR for enterovirus will increase the value of this effort
- Performing desired monitoring as a research effort not feasible
  - Too expensive because of sample size required
  - STAR grants limited in scope/funding, are for creative research, and are not for information gathering
  - Undisinfected PWS generally unwilling to participate

Why Consider Noroviruses for UCMR3

- **Philosophical reasons:**
- Noroviruses are a leading cause of GI illness in adults
- We have an opportunity to, on a larger scale, corroborate the UCMR results with those of Borchardt (who correlated Norovirus q-PCR occurrence with illnesses)
- **Practical reasons**
- Noroviruses on CCL3; need to make a Reg Det
- Despite an investment of significant research effort by ORD and others, there is no cell-culture method available, and likely won't for the foreseeable future
- The incremental cost of adding Noroviruses to UCMR3 (presuming that we include Enteroviruses) is low
- Including Noroviruses in UCMR3 allows us to use SRF funds for analyses, and allows us to acquire contract support through commercial laboratories.

Environmental Justice

- Previous UCMRs considered EJ neutral
- One thought was to select small systems from counties with lowest per capita income or high minority population
- We could then compare to small systems randomly selected for List 1 UCMR analysis
- Concerns:
  - County level frame is too wide, no data for tighter frame
  - Considerable additional work and expense (Estimated $5M SRF)
  - Would preclude other small system monitoring
  - We are conducting a retrospective look at UCMR 1 & 2

Method 538

(LC/MS/MS)

Acephate

Methamidophos

Oxydemeton-methyl

Dicrotophos

Demeton-S-methylsulfone

Fenamiphos sulfone

Fenamiphos sulfoxide